

### Remarks

By this Response, claim 46 has been amended to conform certain language in this claim to similar language in claims 20 and 42. No claims have been amended, cancelled or newly added. Thus, claims 1-3, 6-46 and 48-53 remain pending. Reconsideration and allowance of all the claims pending in the application are respectfully requested in view of the following comments.

This is the seventh Office Action on the merits for this application, the first being issued more than 3-1/2 years ago. Applicant submits that this application has been thoroughly examined and expects immediate allowance of this application. Applicant fails to understand why these rejections could not have been raised earlier. Applicant objects to such piecemeal examination at least because it significantly impacts Applicant's patent term.

Moreover, claims 20-37 and 40-45 were previously allowed and claims 5-7, 12, 13, 15-17, 40, 41, 51 and 52 were found to contain allowable subject matter in the first Office Action mailed May 12, 2005. Applicant submits that the applied references still lack features that were missing in the previously applied references. As such, since the above-listed claims were either found to be previously allowed or contain allowable subject matter, then these claims should also be found either allowed or allowable.

Claims 1-3, 10, 16-24, 34-43, 46, 49 and 51-53 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,417,974 to Schuster ("Schuster"). Applicant respectfully traverses this rejection for at least the following reasons.

Applicant respectfully submits that the cited portions of Schuster fail to disclose, teach or render obvious a lithographic apparatus comprising, *inter alia*, a joint between an element of the projection system and its support comprises an inorganic layer comprising (i) metal, (ii) ceramic, (iii) glass, or (iv) any combination of (i) – (iii), and comprises glue protection, as recited by claim 1; a lithographic apparatus comprising, *inter alia*, a fluid tight joint between an element of the projection system and its support comprises a direct bond by which molecules of the

element and its support chemically interact, as recited by claim 20; a lithographic apparatus comprising, *inter alia*, a projection system configured to project the patterned beam onto a target portion of the substrate, the projection system having a lens, a lens support and an inorganic material providing a fluid tight seal between the lens and the lens support wherein the seal was made without heating, as recited by claim 38; a lithographic apparatus comprising, *inter alia*, a direct bond, by which molecules of the lens and the lens support chemically interact, providing a fluid tight seal between the lens and the lens support, as recited in claim 42; and an immersion projection system manufacturing method comprising, *inter alia*, joining an element of a projection system, that in use in a lithographic apparatus comes in contact with a liquid, with its support using an inorganic layer comprising (i) metal, (ii) ceramic, (iii) glass, or (iv) any combination of (i) – (iii), and glue protection, direct bonding, or both, as recited by claim 46.

#### Claim 1

Schuster is directed to a plurality of optical elements supported in mounts, wherein the last optical element 1 is connected directly to the penultimate optical element 2 in a mount-free manner. See, Abstract of Schuster. The Office Action identifies the optical element 1 of Schuster as the recited element of the projection system, the optical element 2 as the recited support, and layer 2 as the recited inorganic layer comprising (i) metal, (ii) ceramic, (iii) glass, or (iv) any combination of (i) – (iii).

The Office Action states “[t]hus, it can be seen, [Schuster] has disclosed all the features of claim 1 of the present invention.” After this assertion and in a seemingly contradictory statement, the Office Action states “[u]sing a glue in the joint would provide further protection by making the joint air-tight. [s]ince providing an air-tight joint in the projection system is used in both dry and wet lithography, one of ordinary skill in the art would have been motivated to use glue in the joint.” See, Office Action, pages 2 and 3. These two statements in the Office Action make it unclear as to which position the Office is taking. Applicant respectfully request that this issue be clarified.

Assuming *arguendo* (which Applicant does not concede) that it is the Office’s position that the cited portions of Schuster disclose all the features of claim 1, then

Applicant respectfully traverses. In particular, Schuster at lines 22-39 of column 3 states:

As may be seen from FIG. 1, the last optical element 1 of an objective 10, which is represented in FIG. 6 only in principle and in a simplified way and which is provided with a plurality of lenses, supported in mounts, as optical elements, is held in a semiconductor lithography projection exposure machine without a mount directly on the optical element 2, which is now the penultimate one, of the objective 10. The connection is performed by so-called wringing, that is to say the two optical elements 1 and 2 bear directly against one another without a clearance. ***When the lens 2 consists of crystalline material, for example a fluoride such as  $\text{CaF}_2$ ,  $\text{MgF}_2$  or  $\text{NaF}$ , a thin layer 3 made for [sic] amorphous inorganic material such as silica glass ( $\text{SiO}_2$ ), is applied to a wringing surface 4 of the lens 2 in order to improve the wringing.*** The thin layer 3 can be applied using known techniques such as sputtering of  $\text{SiO}_2$  onto  $\text{MgF}_2$ , which produces a layer which adheres well and has a good smoothing effect. (emphasis added)

In other words, the layer 3 between optical elements 1 and 2 is a material made from silica glass. This joint between optical elements 1 and 2 does not provide glue protection, as recited in claim 1. Indeed, there appears to be no reference in the cited portions of Schuster to glue as claimed.

Assuming *arguendo* that it is the Office's position that the cited portions of Schuster do not disclose all the features of claim 1, but that it would be obvious to add the feature of the glue protection, Applicant again respectfully traverses.

Even assuming *arguendo* that the cited portions of Schuster can be modified (which Applicant does not concede), the Office Action has not provided the necessary objective reasoning as to why one of ordinary skill in the art would modify the teachings of Schuster. The Office Action concludes that "[u]sing a glue in the joint **would provide** further protection by making the joint air-tight." Office Action, page 2. Applicant respectfully submits that this reasoning is inadequate because the Office Action has only offered a conclusory statement. This is clearly inadequate under the Supreme Court's *KSR* decision. See *KSR Int'l. Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007) (a determination must be made as to "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit").

A mere statement that a purported modification allows a particular capability (i.e., a joint that is air-tight) is not a sufficient basis for an obviousness determination. The purported motivation cited in the Office Action fails to provide a basis for modifying Schuster and also fails to render obvious the particular modification (i.e., adding glue protection) upon which the rejection is based. For example, there appears to be no reference in the cited portions of Schuster to glue as claimed and thus the cited portions of Schuster provide no teaching regarding the claimed glue protection.

The lack of any cogent reason or objective evidence to modify Schuster is a fundamental shortcoming of the rejection, and shows that the Office Action is engaging in a hindsight reconstruction of the prior art. This is impermissible. See *In re Wesslau*, 353 F.2d 238, 241, 147 USPQ 391, 393 (CCPA 1965) (“reconstruction of the prior art patents in light of appellant’s disclosure is contrary to the requirements of 35 U.S.C. § 103”). For example, there is no disclosure or teaching in the cited portions of Schuster of “making the joint air-tight” used as the basis in the Office Action for the alleged modification. Indeed, there is no indication in the cited portions of Schuster that its joint needs to be modified, except by hindsight reasoning based on Applicant’s disclosure.

#### Claims 20, 38 and 42

With regard to claims 20, 38 and 42, the Office Action has provided no teaching or technical basis to establish that the thin layer 3 for joining optical element 1 to optical element 2 in Schuster are involved in or could be modified to be “a fluid tight joint” as recited by claim 20 or “a fluid tight seal” as recited by claims 38 and 42. Indeed, the cited portions of Schuster make no mention of, for example, liquid or other fluid not being able to enter between optical element 1 and optical element 2.

Moreover, even if the cited portions of Schuster were to disclose or teach the fluid tight joint or seal of claims 20, 38 and 42 (which Applicant does not concede), the Office Action makes no reference in the cited portions of Schuster that the asserted Schuster joint involves molecules of the optical element 1 and the optical element 2 chemically interacting and thus the cited portions of Schuster fail to disclose or teach a direct bond by which molecules of the element and its support chemically interact, as recited in claims 20 and 42. Further, the Office Action makes

no reference in the cited portions of Schuster that the asserted Schuster optical elements 1 and 2 have an inorganic material providing a seal between the lens and the lens support wherein the seal was made without heating, as recited in claim 38.

Claim 46

With respect to claim 46, for similar reasons as presented above with respect to claim 1, Applicant submits that the Office Action has failed to establish that the cited portions of Schuster disclose or teach, *inter alia*, joining an element of a projection system with its support using an inorganic layer comprising (i) metal, (ii) ceramic, (iii) glass, or (iv) any combination of (i) – (iii), and glue protection.

Further, for similar reasons as presented above with respect to claims 20 and 42, the Office Action makes no reference in the cited portions of Schuster that the asserted Schuster joint involves molecules of the optical element 1 and the optical element 2 chemically interacting and thus the cited portions of Schuster fail to disclose or teach, *inter alia*, direct bonding by which molecules of the element and its support chemically interact, as recited in claim 46.

Thus, Applicant submits that the cited portions of Schuster do not, either expressly or inherently, teach or render obvious all the features of claims 1, 20, 38, 42 and 46. Therefore, claims 1, 20, 38, 42 and 46 are allowable. Claims 2, 3, 10, 16-19, 21-24, 34-37, 39-41, 43, 49 and 51-53 depend from and recite additional features from claims 1, 20, 38, 42 and 46, respectively. Therefore, claims 2, 3, 10, 16-19, 21-24, 34-37, 39-41, 43, 49 and 51-53 are allowable at least by virtue of its dependence on claims 1, 20, 38, 42 and 46, respectively, and for the additional features they recite.

Accordingly, Applicant respectfully requests that the rejections of claims 1-3, 10, 16-24, 34-43, 46, 49 and 51-53 be withdrawn.

Claims 1, 8, 14, 16-20, 23, 24, 26, 32-37, 42-46 and 48-53 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,392,824 to Holderer *et al.* ("Holderer"). Applicant respectfully traverses this rejection for at least the following reasons.

Applicant respectfully submits that the cited portions of Holderer do not disclose, teach or render obvious all the features of claims 1, 20, 42 and 46.

Holderer is directed to an assembly including a lens 1 and a mounting 2. In particular, the cited portions of Holderer disclose the lens 1 connected to the mounting 2 using a solder 22, wherein the joint comprises a plurality of layers, including an adhesion layer 11 (i.e., chromium), a solderable diffusion barrier layer 12, and a first oxidation protection layer 13. See, Holderer at lines 30-33 of column 2.

#### Claim 1

Applicant respectfully submits that the cited portions of Holderer fail to disclose, teach or render obvious a lithographic apparatus comprising, *inter alia*, a joint between an element of the projection system and its support comprises an inorganic layer comprising (i) metal, (ii) ceramic, (iii) glass, or (iv) any combination of (i) – (iii), and comprises glue protection, as recited by claim 1. There appears to be no reference in the cited portions of Holderer to glue as claimed. The adhesion layer 11 of Holderer, which Holderer identifies as chromium, is not glue protection. Rather, it is a layer to which the solder of Holderer can better adhere. It is more akin to an inorganic metal layer as recited in claim 1.

#### Claims 20 and 42

With regard to claims 20 and 42, the Office Action has provided no teaching or technical basis to establish that the adhesion layer 11 used in the joint of lens 1 to mounting 2 in Holderer is involved in or could be modified to be “a fluid tight joint” as recited by claim 20 or “a fluid tight seal” as recited by claim 42. Indeed, the cited portions of Holderer make no mention of, for example, liquid or other fluid not being able to enter between lens 1 and mounting 2.

Moreover, even if the cited portions of Holderer were to disclose or teach the fluid tight joint or seal of claims 20 and 42 (which Applicant does not concede), the Office Action makes no reference in the cited portions of Holderer that the asserted Holderer joint involves molecules of the lens 1 and the mounting 2 chemically interacting and thus the cited portions of Holderer fail to disclose or teach a joint that comprises a direct bond by which molecules of the element and its support chemically interact, as recited in claim 20. Further, the Office Action makes no

reference in the cited portions of Holderer that the asserted Holderer lens 1 and mounting 2 have an inorganic material providing a seal between the lens and the lens support wherein the seal was made without heating, as recited in claim 38.

Claim 46

With respect to claim 46, for similar reasons as presented above with respect to claim 1, Applicant submits that the Office Action has failed to establish that the cited portions of Holderer disclose or teach, *inter alia*, joining an element of a projection system with its support using an inorganic layer comprising (i) metal, (ii) ceramic, (iii) glass, or (iv) any combination of (i) – (iii), and glue protection.

Further, for similar reasons as presented above with respect to claims 20 and 42, the Office Action makes no reference in the cited portions of Holderer that the asserted Holderer joint involves molecules of the lens 1 and the mounting 2 chemically interacting and thus the cited portions of Holderer fail to disclose or teach, *inter alia*, direct bonding by which molecules of the element and its support chemically interact, as recited in claim 46.

Therefore, Applicant respectfully submits that a *prima facie* case of obviousness has not established and that the cited portions of Holderer, fail to disclose, teach or render obvious each and every element recited by claims 1, 20, 42 and 46. Claims 8, 14, 16-19, 23, 24, 26, 32-37, 43-45 and 48-53 depend respectively from claims 1, 20, 42 and 46 and are, therefore, patentable for at least the same reasons provided above regarding claims 1, 20, 42 and 46 respectively, and for the additional features recited therein. Thus, Applicant respectfully requests that the rejections of claims 1, 8, 14, 16-20, 23, 24, 26, 32-37, 42-46 and 48-53 under §103(a) over Holderer be withdrawn and the claims be allowed.

All rejections have been addressed. It is respectfully submitted that the present application is in condition for allowance, and a notice to that effect is earnestly solicited. Should there be any questions or concerns regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

STREEFKERK ET AL. -- 10/719,683  
Attorney Docket: 081468-0306882

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Respectfully submitted,

  
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Date: December 16, 2008

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